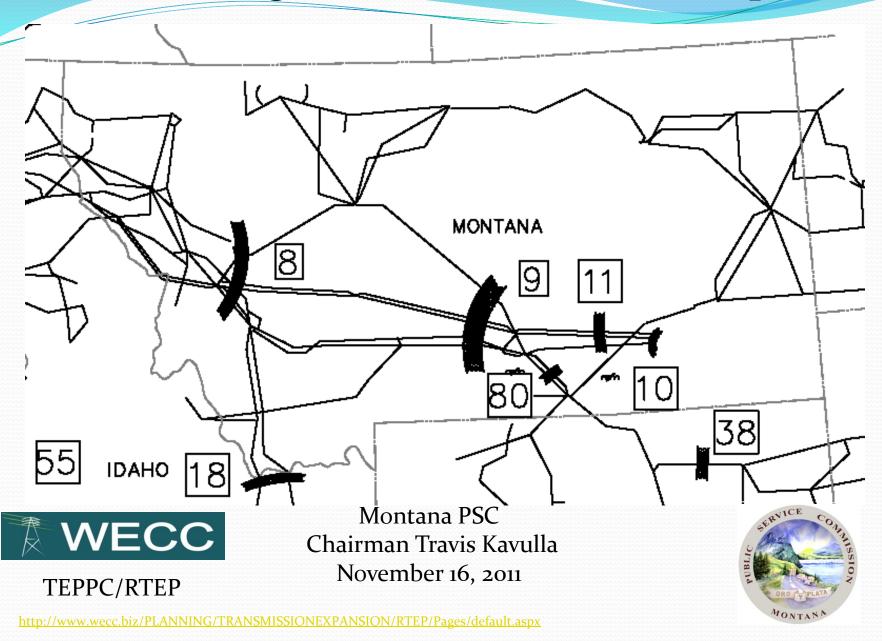
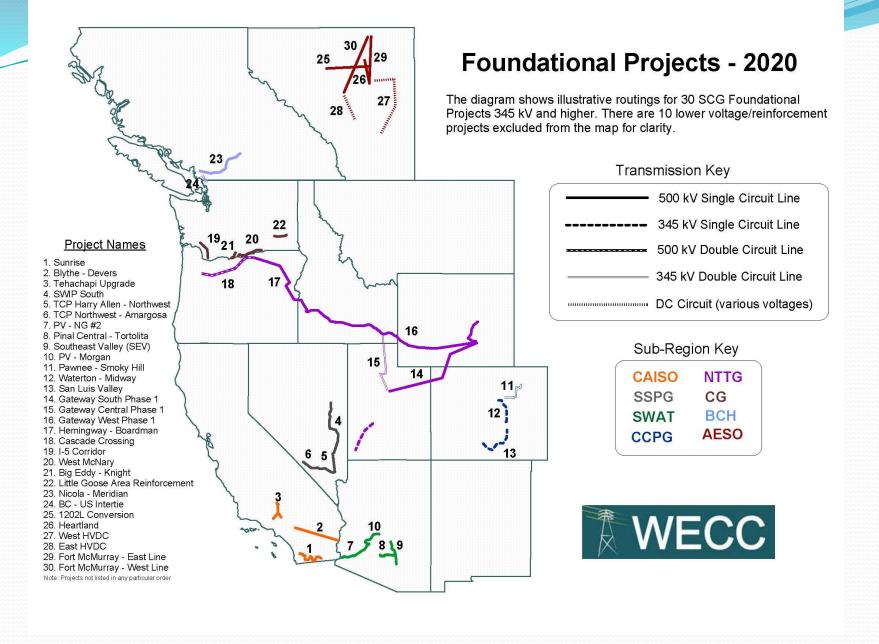
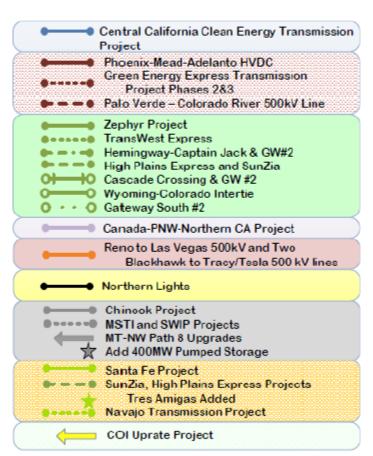
WECC Regional Transmission Plan Update





Transmission Expansion Projects Considered





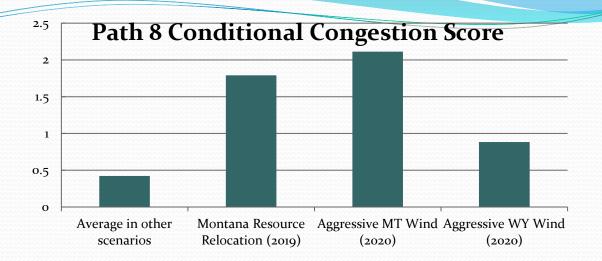


Summary and Recommendations:

- •WECC developed its first 10-year transmission plan and delivery it to the Department of Energy (DOE) in September of 2011.
- •WECC's current approach is heavily focused on the analysis and identification of congestion across the major transmission paths based on the modeling runs of the 2010 study program, applied within the framework of an evaluation of potential capacity additions and specific transmission projects, both planned and in-progress.
- •Recommendations identify three high priority areas defined as "paths of concern": (a) "Pacific Tie" i.e. combined COI and PDCI (Paths 66 and 65); (b) "Montana Export" i.e. lines out of Montana (Paths 8, 18 and 80); and (c) TOT 2C (Path 35).

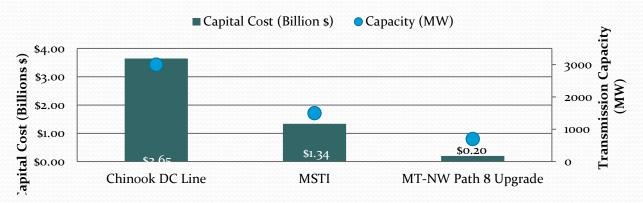
Montana to Northwest - Path 8

- The utilization of and congestion on the Montana to Northwest transmission path (Path 8) increases under most conditions (i.e., renewable generation re-location in Montana) analyzed in support of the Plan.
- WECC recommends consideration by decision-makers for transmission upgrades or other mitigating measures that relieve congestion on path 8 as renewable generation is expanded in Montana.
- Path 8 was built to be a high utilized transmission line that moves base load power from Eastern Montana to the Pacific Northwest. Congestion appears once higher levels of generation are added (>500MW).



- In both Montana resource scenarios, Path 8 operated above 90 percent of its limit for at least 40 percent of the year. This extreme level of utilization is reflected in the high conditional congestion score.
- The drastic increase in congestion along Path 8 in these specific Montana and Wyoming resource scenarios is due to the system's inability to integrate the amount of renewable resources modeled while continuing to operate base load coal units in a traditional manner without additional transmission.

Montana Export Transmission Expansion Projects

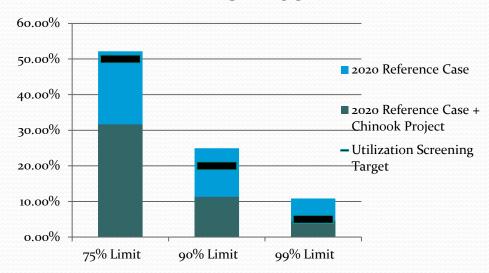


<u>Chinook</u> – 500 kV DC, 3000 MW electric transmission line originating near Harlowton, Montana, traversing Idaho and terminating in the Eldorado Valley, south of Las Vegas, Nevada.

MSTI – 500 kV AC, 1500 MW transmission line, delivering electricity from Montana to customers in the western US. The intent of the MSTI project addresses the need for new electric transmission service: generating sources to customers, and to bolster the western power grid.

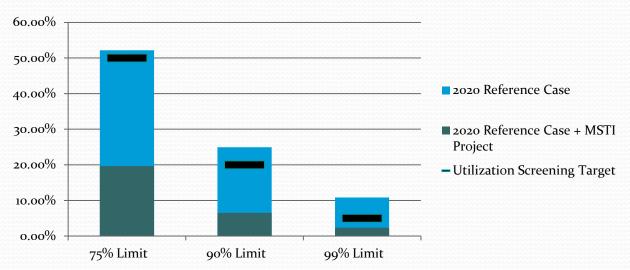
<u>Path 8 Upgrade</u> – A series compensation project that would increase the Path 8 rating from 2200 MW to 2900 MW.

Montana to Northwest Utilization: Chinook



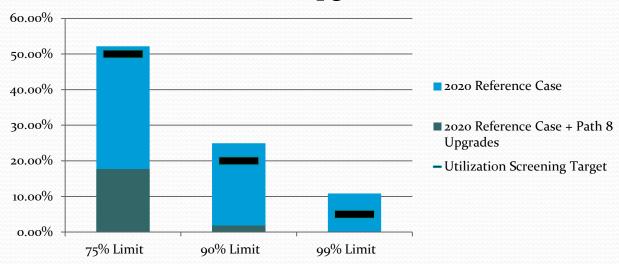
- In addition to reducing the congestion along Path 8, the Chinook project also reduced the WECC-wide average U99 from 5.74 to 5.64 percent.
- The average U₇₅ decreased from 15.08 to 13.63 percent, as well. Overall, the Chinook project was effective at reducing congestion along Path 8 and lowering WECC-wide utilization values.

Montana to Northwest Utilization: MSTI



- The addition of the MSTI project also resulted in the Montana Northwest no longer passing the utilization screening.
- All three utilization metrics decreased, with more than 30 percent decrease in the U₇₅ metric.
- In the MSTI scenario, the entire WECC-wide U90 average did not show substantial change. With the addition of the MSTI project, the total number of paths that passed the utilization screening did not decrease.

Montana to Northwest Utilization: Path 8 Upgrades



The Path 8 Upgrade project resulted in the greatest decrease in Montana – Northwest utilization metrics. The project effectively increased the east to west limit of the line from 2200 MW to 2900 MW. Path 8 did not pass any of the utilization screenings after the implementation of the upgrades.

The Path 8 Upgrades had no effects on the WECC-wide average U90 value, or the number of paths that passed the utilization screening. For those paths that passed the utilization screening in the Path 8 Upgrade Scenario, there were no significant increases or decreases in utilization.

WECC RTEP 10 and 20 Year Plans for 2022 and 2032

Common Case Transmission Assumptions and Scenarios:

Common Case Transmission Assumptions:

- Builds on 2020 Foundational project list for 2022 and 2032 RTEP (WECC) Transmission Plan.
- Projects that have high certainly of being build with be foundation for development of the RTEP 10 (2022) and 20 (2032)year plans.

Criteria 1: Regional Significance

To be included in the CCTA, the projects must meet the following voltage level in order to be of regional significance: 1.projects that are 500 kV and above; or projects at 345 kV unless they are deemed not to be a backbone facility; or 2.projects above 200 kV that are deemed to be backbone facilities.

If the project was regionally significant then it moved on for evaluation in Criteria 2.

Criteria 2: Construction Status

A project that is currently under construction is automatically included on the CCTA list. A project that meets Criteria 1, but not Criteria 2, is further considered in Criteria 3 and Criteria 4.

Criteria 3: Financial Indicators

The SCG used publically available information, provided by project sponsors, in the WECC PIP to assess the development status of projects. The list of fields that project sponsors can respond to for a project is available in Appendix B. The SCG distilled this list of questions down to four main financial indicators used to evaluate the project in Criteria 3.

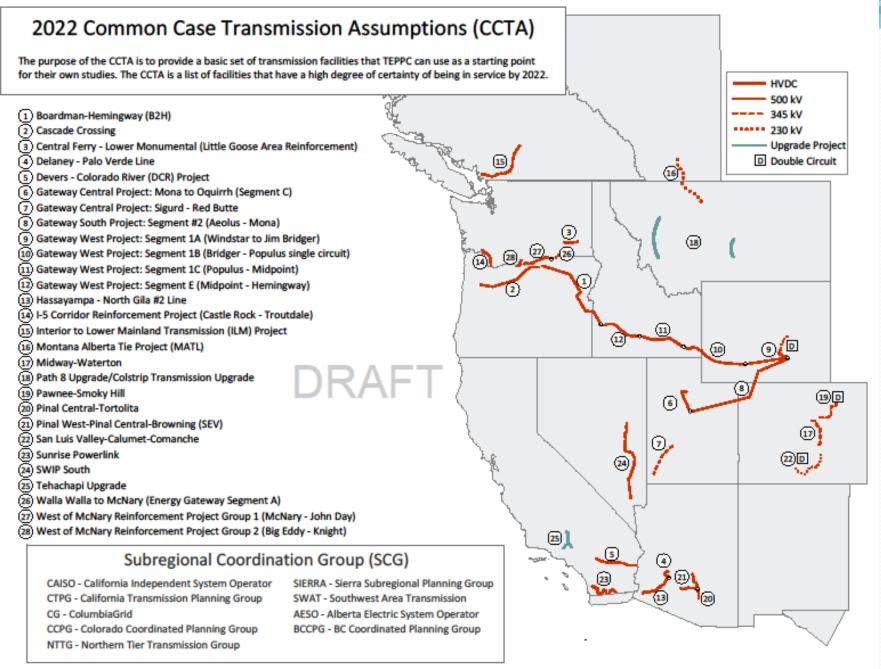
- •Does the project have executed transmission service agreements that commit the project developer to construct the project?
- •Does the project have executed participation contracts from credit worthy shippers that commit the project developer to construct the project? Is the project included in an IRP? Does the project have regulatory approval for cost recovery? In order to be considered eligible for inclusion on the CCTA, there must have been at least one affirmative response ("yes") to one of the preceding financial indicators.

Criteria 4: Implementation Status Indicators

The SCG used publically available information, provided by project sponsors, in the WECC PIP to assess the development status of projects. The list of fields that project sponsors can respond to for a project is available in Appendix B. The SCG distilled this list of questions down to a key implementation indicator used to evaluate the project in Criteria 4. What percentage of the *required* permits have been secured for:

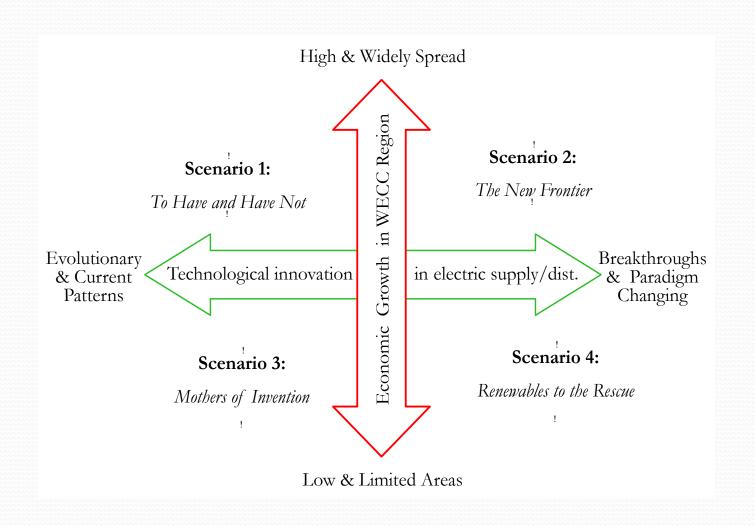
•Federal?, State/Provincial? and Local?

A project must have started at least one of the three applicable permitting processes to be eligible for inclusion on the CCTA.



Path 8 (project 18) is only BPA portion

The following scenarios incorporate input, ideas, and recommendations that the Scenario Planning Steering Group (SPSG)



SPSC requests for 2022 10 Year Plan:

- 1. Reference Case: Utility IRPs and Plans
- 2A. Scenario DSM-1: West-Wide High DSM/DG Scenario
- 2B. Scenario DSM-2: Geographically Targeted High DSM/DG Scenarios
- 3. Alternative California Import and Westwide REC Trading Policy Scenario
- 4. Lower Renewable Generation Scenario
- 5. Alternative Southwest Solar Development Scenarios
- 6. Plant Retirements in the Low Carbon Cases
- 7. Increased Utilization of the Existing Grid Scenario
- 8. Variable Generation Integration Analysis